



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7

11201 Renner Boulevard
Lenexa, Kansas 66219

RECEIVED

JUL 22 2019

BUREAU OF WATER

JUL 12 2019

Mr. Thomas Stiles
Director, Bureau of Water
Kansas Department of Health and Environment
1000 S.W. Jackson, Suite 420
Topeka, Kansas 66612-1368

Dear Mr. Stiles:

RE: Approval of TMDL document for Smoky-Saline River Basin, Salina to Junction City, Kansas

This letter responds to the submission from the Kansas Department of Health and Environment, originally received by the U.S. Environmental Protection Agency, Region 7 on January 28, 2019, for a Total Maximum Daily Load document which contained TMDLs for nitrate as nitrogen. The final approved version was received on July 2, 2019. The Smoky-Saline River Basin was identified on the 2018 Kansas Section 303(d) List as being impaired by total phosphorus. This submission fulfills the Clean Water Act statutory requirement to develop TMDLs for impairments listed on a state's § 303(d) list. The specific impairments (water body segments and causes) are:

Water Body Name	WBID	Cause
Smoky Hill R.	KS-1026000813	Nitrate as Nitrogen
Pee wee Cr.*	KS-1026000856	Unimpaired Tributary
Dry Cr.	KS-1026000836	Nitrate as Nitrogen

**This waterbody is not listed as impaired on the 2018 Kansas Section 303(d) list and is included under the TMDL document for protection. This waterbody was not reviewed for approval by the EPA but is recognized under Section 303(d)3.*

The EPA has completed its review of the TMDL document with supporting documentation and information. By this letter, the EPA approves the TMDLs submitted under § 303(d) and acknowledges the additional water bodies included for protection purposes under § 303(d)(3). Enclosed with this letter is Region 7 TMDL Decision Document which summarizes the rationale for the EPA's approval of the TMDLs. The EPA believes the separate elements of the TMDLs described in the enclosed document adequately address the cause of concern, taking into consideration seasonal variation and a margin of safety.

Although the EPA does not review the monitoring or implementation plans submitted by the state for approval, the EPA acknowledges the state's efforts. The EPA understands that the state may use the monitoring plan to gauge the effectiveness of the TMDL and determine if future revisions are necessary or appropriate to meet applicable water quality standards. The EPA recognizes that technical guidance and support are critical to determining the feasibility of and achieving the goals outlined in these

TMDLs. Therefore, the implementation plan in this TMDL document provides information regarding implementation efforts to achieve the loading reductions identified.

The EPA appreciates the thoughtful effort that the KDHE has put into these TMDLs. We will continue to cooperate with and assist, as appropriate, in future efforts by the KDHE, to develop TMDLs. If you have any questions, contact Jennifer Kissel, of my staff, at (913) 551-7982.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jeffery Robichaud".

Jeffery Robichaud
Director
Water Division

Enclosure

cc: Mr. Trevor Flynn, Chief, Watershed Planning, Monitoring and Assessment Section, KDHE

United States Environmental Protection Agency

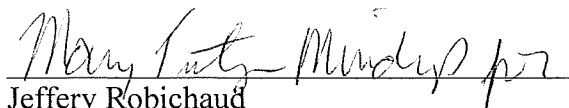
Region 7

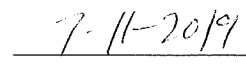
Total Maximum Daily Load Approval



**Smoky Hill River
in Kansas**

Nitrate as nitrogen


Jeffery Robichaud
Director
Water Division


Date

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EPA Region 7 TMDL Review

TMDL ID: KS-10260008

State: KS

Document Name: Smoky Hill River Nitrate as Nitrogen

Basin(s): Lower Smoky Hill

HUC(s): 10260008

Water body(ies): Smoky Hill River

Tributary(ies): Pewee Creek and Dry Creek

Cause(s): Nitrate as nitrogen

Submittal Date: Initial: 1/16/19 Final: 7/02/19

Approved: Yes

Submittal Letter and Total Maximum Daily Load Revisions

The state submittal letter indicates final TMDL(s) for specific pollutant(s) and water(s) were adopted by the state and submitted to the EPA for approval under Section 303(d) of the Clean Water Act [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by the EPA, date of receipt of any revisions and the date of original approval if submittal is a revised TMDL document.

The TMDL document was initially submitted by the Kansas Department of Health and Environment to Region 7 of the U.S. Environmental Protection Agency (EPA) on January 16, 2019. Following comments from the EPA, revised TMDL documents were submitted as email attachments on June 14, 2019 and July 2, 2019.

Water Quality Standards Attainment

The targeted pollutant is validated and identified through assessment and data. The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. The TMDL(s) and associated allocations are set at levels adequate to result in attainment of applicable water quality standards [40 CFR § 130.7(c)(1)]. A statement that the WQS will be attained is made.

The target pollutant, nitrate as nitrogen (nitrate-n) is validated and identified through assessment and data.

Stream chemistry station (SC) SC268, was listed as impaired for nitrate-n because nitrate-n levels exceeded the Kansas Water Quality Standards of 10 mg/L during the period of record (02/04/1995 – 06/30/2017). The 2017 median nitrate-n concentrations at watershed SCs include .30 mg/L at SC514, and 1.4 mg/L at SC281 (Table 4 in the TMDL document.)

The Main Stem Water Quality Limited Segments and Tributaries listed in this document are impaired for the following uses: Expected Aquatic Life, Contact Recreation, and Domestic Water Supply. The load capacity is established to meet the existing nitrate-n water quality criterion of 10 mg/L in the watershed. Current nitrate-n median concentration is given in Table 5 in the document.

The ultimate endpoint of this document will be to achieve the Kansas Surface Water Quality Standards by reducing nitrate-n levels to remove impairments to uses.

The numeric endpoint of this TMDL is 10 mg/L nitrate-n. This nitrate-n criterion is specific to the domestic water supply use, but it will also serve to protect the designated uses for contact recreation, and special aquatic life uses. Nitrate-n concentrations must not measure greater than 10 mg/L more than once in the most recent 10-year period to be considered for delisting. This endpoint applies at all points but is assessed at regular SC stations. Achievement of this endpoint indicates nitrate-n loads are within the loading capacity of the stream, water quality standards are attained, and full support of the designated uses of the stream are restored.

At median flow, the TMDL per day loading capacity (LC) measured at SC268, is 6,048 lbs/day.

The targets in this TMDL document are established at a level necessary to attain and maintain water quality standards.

Designated Use(s), Applicable Water Quality Standard(s) and Numeric Target(s)

The submittal describes applicable water quality standards, including beneficial uses, applicable numeric

and/or narrative criteria, and a numeric target. If the TMDL(s) is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Table 1 of the TMDL document lists the designated uses by waterbody. There are three waterbody segments identified in the TMDL document.

Stream	Segment	Aquatic Life	Contact Recreation	Domestic Supply	Food Procurement	Groundwater Recharge	Industrial	Irrigation	Livestock Watering
Smoky Hill R	13	Expected aquatic life	Primary contact recreation	Domestic supply use	Food procurement use	Groundwater recharge use	Industrial use	Irrigation use	Livestock watering use
Pewee Cr	56	Expected aquatic life	Secondary contact recreation	Domestic supply use	-	Groundwater recharge use	Industrial use	Irrigation use	Livestock watering use
Dry Cr	36	Expected aquatic life	Secondary contact recreation	-	-	Groundwater recharge use	Industrial use	Irrigation use	Livestock watering use

The TMDL document identifies the impaired uses as Expected Aquatic Life, Contact Recreation and Domestic Water Supply.

The domestic water supply numeric criterion for nitrate-n is 10,000 µg/L (10 mg/L) (Kansas Administrative Regulations (K.A.R.) 28-16-28e(c)(3); K.A.R. 28-16-28e(e), Table 1a; Kansas Department of Health and Environment, 2015).

An example TMDL for the monitoring station is given in Table 18 of the TMDL document. The TMDL nitrate-n milestones must be met at all points within the waters. The calculations are made at monitoring stations where the data is collected. The load duration curve method uses the concentration milestone and flow to calculate a load. As an example, the nitrate-n TMDL (loading capacity (LC), WLA (Waste Load Allocation) for the impaired station (SC268) at the median flow is 6,048 lbs/day;

$$\text{TMDL} = (\text{LC}) = 6,048 \text{ lbs/day} = 671(\sum \text{WLA} + \text{Reserve WLA}) + 4,769 (\sum \text{LA}) + 605(\text{MOS})$$

Pollutant(s) of Concern

A statement that the relationship is either directly related to a numeric water quality standard, or established using surrogates and translations to a narrative WQS is included. An explanation and analytical basis for expressing the TMDL(s) through surrogate measures, or by translating a narrative water quality standard to a numeric target is provided (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae). For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and a margin of safety that do not exceed the loading capacity. If the submittal is a revised TMDL document, there are refined relationships linking the load to water quality standard attainment. If there is an increase in the TMDL(s), there is a refined relationship specified to validate that increase (either load allocation or wasteload allocation). This section will compare and validate the change in targeted load between the versions.

There is a direct link between the nitrate and nitrogen TMDL targets and the water quality standards because Kansas' Water Quality Standards include specific numeric nitrate-n criteria for waters with domestic water supply use. The Kansas' Water Quality Standards K.A.R. 28-16-28e Tables of Numeric criteria lists the Domestic Water Supply criterion for nitrate-n as 10,000 µg/L (10 mg/L).

EPA agrees the milestones as explained will address the narrative and numeric criteria outlined in the TMDL document. Once met, the milestones will attain and maintain water quality standards.

Source Analysis

Important assumptions made in developing the TMDL document, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, nonpoint and

background sources of pollutants of concern are described, including magnitude and location of the sources. The submittal demonstrates all significant sources have been considered. If this is a revised TMDL document any new sources or removed sources will be specified and explained.

In the absence of a national pollutant discharge elimination system permit, the discharges associated with sources were applied to the load allocation, as opposed to the wasteload allocation for purposes of this TMDL document. The decision to allocate these sources to the LA does not reflect any determination by the EPA as to whether these discharges are, in fact, unpermitted point source discharges within this watershed. In addition, by establishing these TMDL(s) with some sources treated as LAs, the EPA is not determining that these discharges are exempt from NPDES permitting requirements. If sources of the allocated pollutant in this TMDL document are found to be, or become, NPDES-regulated discharges, their loads must be considered as part of the calculated sum of the WLAs in this TMDL document. Any WLA in addition to that allocated here is not available.

The TMDL document identifies both point and nonpoint sources of nitrate-n loading.

Identified point sources are listed in Table 9 of the TMDL document. Table 9 includes, the current effluent flow (where defined), the current nitrate-n concentration in the effluent (where monitored), the NPDES permit identification and expiration date of the current permit. There are 7 permitted facilities identified. Table 1 below is a summary of the number of each type of NPDES permitted facilities in the watershed.

Table 1. NPDES permitted facilities in watershed.

Type NPDES permitted facility	Number of permitted facilities in watershed
Non-Discharging Lagoon	1
Municipal Mechanical WWTP	1
Industrial quarry – dewatering pit	1
Municipal discharging lagoon	2
Industrial Groundwater Remediation	2

The watershed contains 18 certified or permitted Animal Feeding Operations (AFOs) or Concentrated Animal Feeding Operations (CAFOs) within the Derby SC281 watershed. Any CAFO that does not obtain an NPDES permit must operate as a no-discharge facility. A discharge from an unpermitted CAFO is a violation of Section 301 of the Clean Water Act. It is the EPA's position that all CAFOs should obtain an NPDES permit because it provides clarity of compliance requirements. This TMDL document does not reflect a determination by the EPA that such facilities do not meet the definition of a CAFO nor that the facility does not need to obtain a permit. To the contrary, a CAFO that discharges, has a duty to obtain a permit. If it is determined that any such operation is a CAFO that discharges, any future WLA assigned to the facility must not result in an exceedance of the sum of the WLAs in this TMDL document as approved. There are an estimated 24,578 cattle and calves, in addition to other livestock, listed in Table 12 in the TMDL document.

On-site waste treatment systems were estimated as having 694 septic systems located in this watershed by using the Spreadsheet Tool for Estimating Pollutant Loads. These systems have an estimated failure rate of 10 – 15 percent.

According to the 2010 U.S. census, the total population in the watershed was 126,749 (TMDL Table 15). The population of the city of Assaria and Smolan is expected to shrink slightly by 2040, however, the city of Salina and Saline County is projected to grow by 2040.

Overall land use consists of mostly cultivated crops (48%) and grassland (36%). The TMDL explains, "Cultivated crops typically use nitrogen fertilizers, potentially contributing to elevated nitrate-n in runoff."

Contributing runoff from rainfall is expected from some 37% of the watershed at rates in excess 1.14 in/hr. Overall, the Smoky Hill River watershed has a mean soil permeability of .84 in/hr, placing it in very low permeability category.

Organic material, atmospheric deposition, and groundwater upwelling can contribute background levels of nitrogen to the watershed.

As submitted, the TMDL document contains a complete listing of all known pollutant sources.

Allocation - Loading Capacity

The submittal identifies appropriate loading capacities, wasteload allocations for point sources and load allocations for nonpoint sources. If no point sources are present, the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2(i)]. If this is a revised TMDL document the change in loading capacity will be documented in this section. All TMDLs must give a daily number. Establishing TMDL "daily" loads consistent with the U.S. Court of Appeals for the D.C. circuit decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015, (April 25, 2006).

The LC is identified at the sampling station as part of a load duration curve calculating load based on the median nitrate-n concentrations and flow at various percentiles of flow exceedance. The LCs are calculated at monitoring stations, but the targeted nitrate-n concentrations apply at all points in the segments covered by this TMDL document. The LC for this segment is calculated on flow from outside the TMDL target area and includes non-impairing loads from tributaries and the upstream main stem of the Arkansas River.

The maximum daily load at median flow is 6,048 lbs/day measured at SC268.

The EPA agrees that the LC will attain and maintain water quality standards.

Wasteload Allocation Comment

The submittal lists individual wasteload allocations for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to a water quality standard excursion, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLA. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility it must be stated as such [40 CFR § 130.2(i)]. If this is a revised TMDL document, any differences between the original TMDL(s) WLA and the revised WLA will be documented in this section.

The WLAs are based on the likelihood of a facility being a source of nitrate and design flow of each facility (where available. Some facilities that use groundwater have no design flow established, so the average daily discharge is used instead.)

For facilities not expected to contribute, their WLAs are set to zero. The facility by facility WLAs are given in TMDL Table 17 and the sum of the WLAs and flow exceedance are given in TMDL Table 18. A reserve WLA of 32 lbs/day (calculated at 5% for the entirety of the Smoky Hill River) to accommodate future development.

Table 2. WLA at median flow (pounds/day).

SC Station	WLA
SC268	642

Load Allocation Comment

All nonpoint source loads, natural background and potential for future growth are included. If no nonpoint sources are identified, the load allocation must be given as zero [40 CFR § 130.2(g)]. If this is a revised TMDL document, any differences between the original TMDL(s) LA and the revised LA will be documented in this section.

The LAs are based on the remaining loading capacity after the WLAs are considered. Table 3. LA at median flow, taken at the SC station.

SC Station	LA (lbs/day)
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SC268	4,769
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The load allocation for nonpoint sources is the remaining LC after wasteloads and reserve wasteloads for NPDES discharging permits. To view the full expression of LAs at a wider range of flow exceedances, see TMDL Table 18.

The TMDL document has identified all known nonpoint sources of nitrate-n in the watershed.

Margin of Safety

The submittal describes explicit and/or implicit margins of safety for each pollutant [40 CFR § 130.7(c)(1)]. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided. If this is a revised TMDL document, any differences in the MOS will be documented in this section.

The Margin of Safety (MOS) for this TMDL document is explicit. For this TMDL, an explicit approach of using 10 percent of the LC has been reserved as the MOS.

The EPA agrees that the state has provided explicit MOS to support the TMDL.

Seasonal Variation and Critical Conditions

The submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of the WQS. If this is a revised TMDL document, any differences in conditions will be documented in this section.

The load duration curve accounts for seasonal variation and critical conditions.

The EPA agrees that the state considered seasonal variation and critical conditions during the analysis of this TMDL and the setting of TMDL targets.

Public Participation

The submittal describes required public notice and public comment opportunities and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].

The public was given opportunity to provide feedback during the TMDL process through website postings and public hearings. The TMDL document was posted November 30, 2018 for public review and a public hearing was held on December 14, 2018. No comments were received from the public.

EPA agrees that the public has had a meaningful opportunity to comment on the TMDL document.

Monitoring Plan for TMDL(s) Under a Phased Approach

The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards, and a schedule for considering revisions to the TMDL(s) (where a phased approach is used) [40 CFR § 130.7]. If this is a revised TMDL document, monitoring to support the revision will be documented in this section. Although the EPA does not approve the monitoring plan submitted by the state, the EPA acknowledges the state's efforts. The EPA understands that the state may use the monitoring plan to gauge the effectiveness of the TMDLs and determine if future revisions are necessary or appropriate to meet applicable water quality standards.

The TMDL document identified stations SC514 and SC268 for future water quality monitoring for nitrate-n.

Reasonable Assurance

Reasonable assurance only applies when less stringent wasteload allocation are assigned based on the assumption that nonpoint source reductions in the load allocation will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads. States are not required under Section 303(d) of the Clean Water Act to develop TMDL implementation plans and the EPA does not approve or disapprove them. However, this TMDL document provides information regarding how point and nonpoint sources can or should be controlled to ensure

implementation efforts achieve the loading reductions identified in this TMDL document. The EPA recognizes that technical guidance and support are critical to determining the feasibility of and achieving the goals outlined in this TMDL document. Therefore, the discussion of reduction efforts relating to point and nonpoint sources can be found in the implementation section of the TMDL document and are briefly described below.

The states have the authority to issue and enforce state operating permits. Inclusion of effluent limits into a state operating permit and requiring that effluent and instream monitoring be reported to the state should provide reasonable assurance that instream water quality standards will be met. Section 301(b)(1)(C) requires that point source permits have effluent limits as stringent as necessary to meet WQS. However, for wasteload allocations to serve that purpose, they must themselves be stringent enough so that (in conjunction with the water body's other loadings) they meet WQS. This generally occurs when the TMDL(s)' combined nonpoint source load allocations and point source WLAs do not exceed the WQS-based loading capacity and there is reasonable assurance that the TMDL(s)' allocations can be achieved. Discussion of reduction efforts relating to nonpoint sources can be found in the implementation section of the TMDL document.

The TMDL requires assurances that any less stringent WLA will be met through greater reductions in the LAs. This TMDL does not depend on increased nonpoint source reductions to account for less stringent WLAs.

In addition, the TMDL document identifies authorities available to the state to direct the called for reductions.

1. K.S.A. 65-164 and 165 empowers the Secretary of KDHE to regulate the discharge of sewage into the waters of the state.
2. K.S.A. 65-171d empowers the Secretary of KDHE to prevent water pollution and to protect the beneficial uses of the waters of the state through required treatment of sewage and established water quality standards and to require permits by persons having a potential to discharge pollutants into the waters of the state.
3. K.S.A. 2002 Supp. 82a-2001 identifies the classes of recreation use and defines impairment for streams.
4. K.A.R. 28-16-69 through 71 implements water quality protection by KDHE through the establishment and administration of critical water quality management areas on a watershed basis.
5. K.S.A. 2-1915 empowers the State Conservation Commission to develop programs to assist the protection, conservation and management of soil and water resources in the state, including riparian areas.
6. K.S.A. 75-5657 empowers the Kansas Department of Agriculture, Division of Conservation to provide financial assistance for local project work plans developed to control nonpoint source pollution.
7. K.S.A. 82a-901, et. seq. empowers the Kansas Water Office to develop a state water plan directing the protection and maintenance of surface water quality for the waters of the state.
8. K.S.A. 82a-951 creates the State Water Fund to finance the implementation of the Kansas Water Plan, including selected WRAPS.
9. The Kansas Water Plan provides the guidance to state agencies to coordinate programs intent on protecting water quality and to target those programs to geographic areas of the state for high priority implementation.

The State Water Fund provides \$12-13 million annually for implementation of water quality and pollutant reduction activities.